AD NUMBER

AD836166

NEW LIMITATION CHANGE

TO

Approved for public release, distribution unlimited

FROM

Distribution authorized to U.S. Gov't. agencies and their contractors; Administrative/Operational Use; SEP 1963. Other requests shall be referred to the Army Biological Laboratory, Fort Detrick, MD 21701.

AUTHORITY

SMUFD, per d/a ltr dtd 8 Feb 1972

TRANSLATION NO. 891

DATE: Sept. 1962

DEPARTMENT OF THE ARMY
Fort Detrick
Frederick, Maryland

p

INFECTION IN THE LABORATORY WITH THE LANSING VIRUS

/Following is a translation of an article by Karl Beller in the German-language periodical Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene (Bulletin of Bacteriology, Parasitic Studies, Infectious Diseases and Hygiene), Vol 153, 1949, No 8, pages 269-272./

In connection with experiments dealing with the etilogy of acute inflamatory diseases of the central nervous system, with special attention to poliomyelitis, we received, through the generosity of Prof. Levaditi, the strains 735 and 744 of the Lansing Virus (Armstrong) from the Pasteur Institute in Paris in the fall of 1942. (Other reports will deal with results of the experiments.) These strains were to be used temporarily on rats and mice in order later to be evaluated through immunization of monkeys together with other mouse-pathogenic virus strains which had been isolated from the fluids of the so-called encephalitis of childhood with Prof. W. Keller, then the director of the University Pediatric Clinic. These latter experiments were delayed, requiring repeated re-injection of the two Lansing Virus strains into mice and rats. This gave us an opportunity to check the behavior of rats and mice with intra cerebral and nasal infections in comparison with other neurotropic virus strains. Whereas the rats did not react to the Lansing Virus, the mice usually became sick after an incubation period of 14 days with symptoms of bronchial catarrh in the form of running nose and eye lids becoming stuck shut. Only in the case of a few of the experimental animals did paralysis occur, and then often disappeared after a matter of hours. This made it necessary to observe the animals constantly. The mortality rate was only 27%.

On 20 february 1943 an injection of the strain 735 into white mice was being conducted when a hypodermic needle malfunctioned and caused the injection material to spray out of the rear of the needle. This material consisted of ground brain tissue from mice which had been typically affected and which had been killed in this condition. The resulting spray entered into the eyes and nose of the author and a female lab technitial standing

next to him who had supervised the anesthetization of the animals. Immediate disinfection with oxycyanate rinse did not prevent the occurrence of signs of infection, which appeared after 14 days in each case. The symptoms are compared in the following table, wherein the letters Be denote the author and Ge denote the lab technitian.

Date	Be	Ge
20 Feb	Nasal and conjunctival infection	Nasal and conjunctival infection
5 Mar	37.8° C body temperature, dullness, bronchial catarrh symptoms	Head ache, common cold symptoms
6 Mar	Temperature 38.5°, generally poor feeling, consipation	Temperature 38.5°, generally poor feeling, dizziness, turning head painful
7 Mar	Temperature 38.5°, pain in area of base of skull extending into neck. Cold symptoms diminished	Temperature 38.2°, no change in head ache, diarrhea, improvement in symptoms of common cold
8 Mar	Steady pain in head with subfebrile temperature	Changing disposition, continued pain experienced in turning neck
9 Mar	Temperature normal, reappearance of catarrh symptoms, general weakness of muscles, feeling of heaviness in right arm	In the morning, improvement in overall feeling, towards 4:00 o'clock p.m. sudden difficulty in breathing and dizziness to the point of unconsciousness, sharply increased heart beat
10 Mar	Unchanged feeling overall, laryngitis and tracheobronchitis of increasing severity	Again strong head ache in the morning, gradually subsiding. Feeling of heaviness in body, particularly in right leg
11 Mar	Exhaustion, muscle soreness	Improvement in general disposition while hospitalized.
12 Mar	No change	Continued improvement
13 Mar	Dizziness and association disturbance	As above with massage of the leg having good effects

During the first ten days of sickness, both cases progressed in a similar manner, even though Be was at the time a 48 year old man and Ge was a 20 year old girl. The similarity can be noted particularly in the date of becoming sick, the occurrence of the bronchial symptoms, the head pains which were definitely localized in the area of the base of the skull in one case and in the feeling of "heaviness" denoting a disturbance of the nervous system and which was clearly felt in one case in the right arm, in the other case in the right leg. Also, the radiation of head pains into the area of the neck was common to both cases, so that, in spite of some variations, one could speak of a common ailment in both patients. The differences consisted of the sudden difficulty in breathing experienced by Ge on the 4th day and the loss of consciousness, which seemed to give this case a very serious character.

However, whereas the slow disappearance of muscle weakness, promoted by massage treatment, brought final relief to Ge, Be continued to be afflicted with the laryngitis symptoms which occurred on the 5th day. A months-long treatment , including inhalation and repeated throat-painting by a specialist (Prof. Br of the Ear-Nose-and-Throat Clinic of Ludwigs University in Giessen), failed to give relief. Prof. Br's findings are quoted as follows:

"Examination of the larynx revealed an edematous swelling and reddened left vocal cord which fluttered back and forth in breathing. The total larynx seemed to be infected and inflammed, the rear wall being covered with pus-like mucus. The voice was very hoarse, speaking causing pain. Inhalation treatment was ordered, this having only a very minor beneficial effect through August 1943. Because of bronchitis existing simultaneously, I ordered a cure period at a spa with an inhalatorium a salt graduator."

Following this advice, a cure period was started in late August 1943 at Bad Nauheim. But after only one week, a very painful ischiatic neuralgia of the right side set in following a salt bath. After unsuccessful treatment by the local doctor (Dr H.), this caused hospitalization in the University of Medicine in Giessen in late September 1943. The findings of the head doctor (Prof. V.) read as follows:

"The patient was infected in the course of his experiments with poliomyelitis in the spring of 1943. At that time, symptoms of bronchial catarrh appeared in the upper respiratory tract, with a persistent laryngitis with asmatic character due to his constitutional allergy prevailing. Later neuralgic symptoms in his right leg appeared, tapering off gradually. For this reason, I brought in the director of the psychatric and nerve clinic (Prof. Bo) as a consultant. There were no indications of a multiple sclerosis. At one time during the stay of several weeks

in the clinic an exanthema broke out in the face, as well as a phlyctena of the right eye. Aludrin and Bellegral brought about a certain improvement in the patient's condition, but the strong vegetative over-sensitivity persisted."

The last-mentioned condition characterized the following period, during which repeated treatment was necessary, both as an out patient and by hospitalization, and during which period sinusitis, pharyngitis, laryngitis and bronchitis were diagnosed. Then, in July 1947, a condition suddenly occurred which at first resembled that which has been described as immediately following the infection in the laboratory. It began with head aches and neuritic conditions in the facial area. At first there was also a slight increase in body temperature. On 28 July 1947, after one week of sickness, hospitalization took place with temperature of 39.8° C. The blood sedimentation reaction was 105 mm in the first hour. The findings of the clinic director (Prof. H.) are quoted below. The high fever condition continued for four weeks and occaisionally became critical. It had a septic character, although no pathogenic germ could be cultured from the blood.

In the interests of completeness it should be mentioned here that the reaction to the Gruber-Widal tests for typhoid, paratyphoid, enteritis of type Breslau and Gaertner and Bang's disease (undulant fever) was negative. The findings continued: "In the foreground was a very severe bronchitis. Then there occurred a very marked swelling of the liver and a very painful orchitis, accompanied by a swelling and pressure sensitivity of the testes, particularly the right one. The leucocyte count was at first moderately increased, but then increased from 10,000 to 23,400, returning to normal after four weeks. Despite continued administration of large doses of sulfonamide, an improvement and stilling of the sickness could be attained only through penicillin. The serious condition of the patient prevented X-ray examination of the chest cavity during the first part of the period of hospitalization. Later X-ray pictures showed a temporary swelling of the liver and, above all, an increased shading of the lungs indicating bronchitis-peribronchitis; namely an area in the center of the right lung of about the size of a three-mark piece /approximately the size of a US 50 cent piece/ which indicated a change in the path of the smaller bronchial tube."

Weeks, and even months later, increased temperature and severe bronchial irritation occurred. Its etiology seemed to be that, due to a chronic inflammation of the bronchial mucous membrane which was partly coupled with an anatomic change in the bronchial tube walls, a septic condition developed through the bacterial infection being grown over. The latter described period of sickness differed from the first only through the inclination towards this complication; the irritant condition which caused it was already recognized in the findings of the University of Medicine as the result of infection with the Lansing virus.

The last doctor therefore concluded that "the inflammation resulting immediately after the virus infection in the bronchial tubes led to anatomic changes in same, which became the cause of the serious sickness in the year 1947."

By way of reinforcing this opinion, I should like to refer to experiments on mice /see note/ which, after surviving infections with the Lansing virus, were infected with bacteria of swine erysipelas in order to activate a latent remnant of the virus infection which we suspected. The results of this experiment were disappointing in this respect. However, it was observed that the test mice which had survived the Lansing virus infection had a markedly lower resistance as compared to control animals which had not been treated with the Lansing virus. This was demonstrated throughout a period of many months by the reduction of the dosis letalis minima by 10-100 times. I consider this finding to be worthy of mention in view of the often-indicated prior sickness of poliomyelitis cases which have long been considered as preparing the way for the virus infection when, in actuality, it is a result of the virus infection. In my opinion, the above described experience proves this, even though the other symptoms which were brought about directly by the Lansing virus do not coincide with the symptoms of infantile paralysis. (Note: Our stock of experimental animals was continually checked against outside virus infection.)

Summary:

The author describes 2 cases of an infection in the laboratory with the Lansing virus (Armstrong) which after an incubation of a fortnight began with central nervous and catarrhal symptoms. The further course of the disease showing symptoms similar to those of influenza and accompanied by peripheral disturbances was shorter with the young female patient than with the author who for several years suffered from recidivations of a partly life-threatening character. The symptoms are related to the diminished resistance to bacterial superinfections found, by experiments, in mice which had been infected with the Lansing virus and had survived the vaccinal disease. The Lansing virus could thereby not be activated.

BIBLIOGRAPHY

1. Bieling and Heinlein, Viruskrankheiten des Menschen (Virus Illnesses of Man), Wiesbaden, 1947.

2. Armstrong, Public Health Rep., Vol 54, 1939, pages 1719-2302.

- END -